

United States Utility Patent Application

Construction Hole Safety Device

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5 FIELD OF THE INVENTION

The present invention relates to the field of construction, especially construction of commercial and residential buildings. More specifically, this invention relates to safety devices for construction workers.

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BACKGROUND OF THE INVENTION

Workers face a variety of hazards on a construction site. Many of these dangers are well known, and a number of safety devices developed to alleviate them. The construction hard hat is perhaps the best known of these.

A somewhat lesser described hazard is that offered by small holes in the ground. These are often man-made during the construction of drains, electrical wiring, lighting systems, and the like. While these are rarely large enough for an adult to fall into, they do provide a tripping hazard. They are of particular concern to workers on ladders or high stools or walkers. These can easily be caught in a small hole and tip over, resulting in injury to the workers aboard the ladder or equivalent.

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Description of the Prior Art

The present invention falls into the category of construction safety devices. There is a wealth of prior art in this area.

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One relevant prior patent is US 5,043,539, issued to inventor J.V.DeBartolo, jr. on Aug. 27, 1991. His invention describes a knockout device for a wall.

Another relevant prior patent is US 6,076,559, issued on June 20, 2000 to inventor G.N.Castillo, describing a disposable protective cover for conventional plumbing fixtures during floor construction. However, this patent says nothing about being able to walk
5 over it. In fact, it is shaped like a cup, and is designed to preserve a hole, not to cover it. As such, it is not a safety device.

D.D. Palmer is the inventor on yet another relevant prior patent, US 5,507,501, which describes a sealing disc that is used in the pressure testing of a drain or vent in a
10 plumbing system.

J.P. Lott et. al. are the inventors of US 6,195,946, a patent that issued on March 6, 2001. This patent describes concrete forms. In a similar patent, T.W.Meyers in US 5,711,536 describes a seal for walls of poured concrete.
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There is a need for a simple device that can protect construction workers from holes in the ground, particularly holes created by prior construction work. A protective device should be inexpensive yet durable, strong enough to bear the weight of a person walking thereon, and secure against forces (such as wind or running water) that may tend to move
20 the device out of position.

BRIEF SUMMARY OF THE INVENTION

The present invention consists of a strong rubber or plastic unibody with cap and stem that is sized to fit precisely into the opening of a man-made construction hole, and remain
5 securely therein until removed.

It is an object of the present invention to provide a safe environment for construction workers, especially during early and middle stages of construction.

10 It is another object of the present invention to prevent people from inadvertently stepping into holes created in the process of construction, and thereby possibly suffering injury.

It is yet another object of this invention that workers on movable scaffolding be protected from moving said scaffolding into a hole, possibly tipping over and causing injury to
15 workers.

It is a further object of the present invention to create a device that is clearly visible to people nearby, and warns them of a danger posed by a hole potentially in their path.

20 It is yet another object of this invention that the device is capable of remaining in place and in service until removed by workers utilizing the hole for construction, and thereby removing the hazard.

It is yet another object of this invention that the device is capable of keeping a
25 construction hole clean and free of debris that might otherwise accumulate within said hole, and later interfere with subsequent construction activities.

It is yet another object of this invention that the device is suitably made of materials that are best utilized for durability and long life in construction service.

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It is yet another object of this invention that the device be lightweight and inexpensive, yet strong and durable.

The foregoing objects of the invention, and other objects and advantages will become
5 apparent from the detailed description of the preferred embodiment below.

BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 displays from a side view a preferred embodiment of the current invention for use in circular (round) holes.

Fig. 2 shows the same preferred embodiment of the present invention from a top view.

15 Fig. 3 presents a side view of a second embodiment of the present invention in the manner of Fig. 1. This embodiment is rectangular, for rectangular cutouts.

Fig. 4 shows the second embodiment of Fig. 3 from a top view, in the manner of Fig. 2.

20 Fig. 5 displays a top view of the preferred embodiment after a warning label has been applied.

Fig. 6 shows the second embodiment of Fig. 3 from a top view, after a warning label has been applied.

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Fig. 7 presents an application of the preferred embodiment to protect a drain site during construction of a residential bathroom.

Fig. 8 presents an application of the preferred embodiment to protect various drains and
30 sites of floor lights during construction of a commercial building.

Fig. 9 presents an application of the preferred embodiment to protect a drain site during construction of a residential bathroom.

5 Fig. 10 displays yet another application of the preferred embodiment to protect coring holes for future installation of electrical panels in an industrial setting.

Fig. 11 displays still another application of the preferred embodiment on a residential kitchen site.

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Fig. 12 displays yet another application of the preferred embodiment in an office or industrial bathroom site, again to protect drain holes.

15 Fig. 13 shows a couple of embodiments of the current invention from a side view, showing the top covers only.

In Figure 14 is seen the current invention in place on a floor, either without (above) or with (below) sub-frame.

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DETAILED DESCRIPTION OF THE INVENTION

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms.

25 Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

30 Referring to Figure 1, a preferred embodiment **100** of the current invention is shown in side profile. It is shown with a top cap **10** and underlying stem **15**. The stem is sized so as

to fit closely in a construction drain hole, with different stem sizes corresponding to different drain sizes.

5 Figure 2 shows the same preferred embodiment **100** of the current invention from a top plan view. Because the stem is sized to fit in the hole snugly, the top view completely obscures the hole.

In one preferred embodiment, the stem **15** will constitute a cylinder of 1 inch in diameter,
10 appropriate for filing a 1-inch drain. The top cap **10** then will constitute a circle of about 1 ½ inches in diameter.

Figure 3 is an alternate embodiment **200** of the current invention from a side plan view. The top cap **20** and the stem **25** are displayed.

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Figure 4 is a top plan view of the same embodiment **200** of the current invention as displayed in Figure 3. From this view it can be seen that this embodiment is rectangular in shape. This is to correspond with rectangular cutout holes, as commonly used to install electrical switches and other components.

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In Figure 5, a view from the top is displayed of the preferred embodiment of the current invention in an example where a warning label **17** has been applied. The warning label consists of yellow lettering in black outline, with alternating black and yellow stripes.

25 The same view with a warning label **27** is displayed of the alternate rectangular configuration of the present invention in Figure 6.

Fig. 7 shows an environment where the present invention could be employed. This is a residential bathroom under construction, with open drain hole **18**. This could be protected
30 with the preferred embodiment of Fig. 1 until the drain cover is installed.

Fig. 8 shows another environment where the present invention could be employed. This is a courtyard area under construction, with open drain holes **18** and holes **19** for floor lighting. These could be protected with the preferred embodiment of Fig. 1 until the drain covers and lights are installed.

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Fig. 9 displays yet another environment where the rectangular embodiment of the present invention could be employed. This is an office area under construction, with open holes **28** for floor installation of electrical wiring for office equipment such as desktop workstations, lighting, and the like.

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Fig. 10 illustrates still another environment where the present invention could be employed. This is an electrical under construction, with open coring holes **14** for floor installation of heavy-duty electrical wiring. These holes could be protected with the preferred embodiment of Fig. 1 until the electrical wiring is installed.

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Fig. 11 depicts still another environment where the present invention could be employed to protect open drain holes **18** until covered in subsequent construction. Likewise, Fig. 12 illustrates an industrial area with open drain holes **18**, suitable for protection by installing the present invention.

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Fig. 13 illustrates selected styles of top caps that could be employed with the present invention. Different curves of the edges, and height of the cap are envisioned. However, in general the cap will be no more than $\frac{1}{4}$ inch in thickness. This is to avoid presenting a tripping hazard.

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Fig. 14 depicts the present invention **100** in place in a hole in a floor. The invention is seen from a cutaway side view. Fig. 14a shows a floor with frame and underframe forming the two lower layers, with the cap of the present invention forming the top layer. Fig. 14b shows the same view, in a floor without underframe. In this case, the frame forms the lower layer, with the cap of the present invention forming the top layer.

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The present invention is made of sturdy materials, such as hard engineering polyethylene, to withstand the weight of heavy construction workers walking or standing on it. The invention is designed to meet all OSHA requirements for safety.

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The stem is sized, both in horizontal and vertical dimensions, to fit snugly in the construction holes. Such precise fitting is important to maintaining the structural integrity of the device, and to allow the device to remain stably within the hole.

10 It should be recognized that holes made for construction purposes are well defined in dimensions, and limited in variability and number of different sizes. Thus, it is feasible to produce the present invention in a limited number of sizes and dimensions, to conform to said limited sizes and dimensions of construction holes.

15 Installation of the present invention is very straightforward. It is simply a matter of selecting the appropriate size and shape of the embodiment that best fits the hole to be protected. The embodiment is then place in the hole with top cover facing up, and thus displaying the optional warning label. The device is left in place until removed by later construction workers, at the time the hole is to be utilized.

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The device is designed to be reusable, and potentially recyclable if damaged during use.